Lesson 11 - Fats In The Diet

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1. Introduction

Fat makes up a larger caloric portion of the American diet than any other foodstuff. The average American's food intake is 40% fat. He eats animal foods rich in fat; he tosses his salads in fat; and he spreads his bread with fat. When he eats out, he patronizes fast food restaurants that deep-fry and grill-fry most of their food in fat.

He lives off the "fat of the land" and "high on the hog," and he suffers from some of the most serious health problems in the world. His arteries become clogged with cholesterol, his breathing becomes short and he dies in what should be his prime years.

Fat is not the only culprit in the American diet, and indeed fat is not "bad," just as proteins and carbohydrates are neither good nor bad. Fat is needed in the diet. It is present in every food we eat—even cucumbers, watermelons and apples have fat.

It is the particular sources from which people get their fat and the way in which fat is utilized in the diet that is "bad," or at least unhealthy.

What you will learn in this lesson is what fats are, how the body uses them, how they are digested and how they should be obtained in the diet. This is the type of understanding we need to evaluate intelligently the role of fats in the human diet.

2. What Are Fats?

2.1 Basic Composition

Fats, or hydrocarbons, are one of three food categories, the other two being proteins and carbohydrates.

Fats are composed of the same three elements as carbohydrates—carbon, oxygen and hydrogen. However, they are much poorer in oxygen and richer in carbon and hydrogen than are carbohydrates. Because of this higher carbon and hydrogen content, fats have a greater heat or energy equivalent than carbohydrates.

The fats found in plants are manufactured from water and carbon dioxide with the aid of chlorophyll, much in the same manner that the carbohydrates in a plant are produced. The fats found in humans and animals come from two sources: 1) from the fats in the diet and 2) from the metabolism of excess carbohydrates into fat. The greatest amount of fat in the body usually comes from carbohydrate metabolism.

As far as the human digestive process is concerned, fats are composed of two components: 1) glycerin (or glycerol) and 2) fatty acids.

Glycerin is the energy source of fats and is metabolized much in the same manner as are the carbohydrates. The glycerin is broken down into sugars which may be used by the body for fuel.

The fatty acids are often spoken of as chains of hydrogen, carbon and oxygen atoms. Simplistically speaking, the fatty acids are to fat what the amino acids are to protein. These chains of fatty acids have links within them where additional hydrogen, oxygen or carbon atoms may be attached to the chain.

If hydrogen is attached to these links, the fat becomes it more solid. This is called *hydrogenated* fat.

All the solid vegetable fats, such as Crisco, margarines, etc., are hydrogenated. If oxygen is attached to one of, these fatty acid links, the fat becomes rancid. Thus, fats left exposed to the air begin to oxidize and become rancid rapidly.

2.2 Unsaturated, Saturated and Hydrogenated Fats

Fat that is unsaturated is composed of fatty acids in which one or more of the carbon atoms in the chain do not have all of their accompanying hydrogen atoms. In other words, unsaturated fatty acids have open available links in their chains.

These open links in fatty acid chains are important. The body is able to combine various nutrients with the fatty acid chains through these open links. This combination of nutrients and fatty acids allows both of them to be transported through the body where they can be used in building cell structure.

Animal fats contain very little unsaturated fats. The chief sources of unsaturated fatty acids are nuts and seeds. Almost all vegetable fats in their natural state have a high proportion of unsaturated fatty acids.

The term *polyunsaturated* means that there is a large number of fatty acids which have two or more open links in their chains. These vegetable polyunsaturated fats are used in making margarine and shortening. This is done by the process of *hydrogenation*.

Hydrogenation causes liquid fats to become solidified by introducing hydrogen atoms into the open links of the fatty acid chains. If a fat becomes completely hydrogenated, it is rock-hard. The process is controlled, however, so that varying consistencies of hydrogenated fats can be produced.

The hydrogenation process consists of heating the fats and oils to a temperature of 212 to 400 degrees. Hydrogen is then mixed in, along with Some catalytic agents, such as nickel or platinum. The fatty acids

then take on the hydrogen atoms and begin to solidify.

The heating of the oils during this process destroys any vitamins that might be present. The addition of the hydrogen atoms fills the open links in the fatty acid chains and thus prevents nutrients from binding with the acids. As a result, hydrogenated fats can supply only empty calories and no nutritive value.

Since hydrogenated fats cannot become rancid (nor can they support life), they are manufactured extensively. Margarine, cooking fats, processed cheeses, lard and peanut butter are but a few products subjected to hydrogenation.

The *saturated* fats are found chiefly in animal fats. Saturated fats are solid at room temperature, unlike the liquid unsaturated fats. Saturated fats are found in animal flesh, dairy products, eggs and coconuts. It should be noted that the saturated fats in coconuts have a different chemical structure.

Like hydrogenated fats, the saturated fats cannot enter into a nutrient bonding within the body. Consequently, they cannot be used effectively by the body in cellular composition than the saturated animal fats metabolism. The saturated fats are usually empty calories that contribute to a fat build-up within the body. They serve no useful function.

2.3 Cholesterol: Villain or Hero?

Accompanying the saturated animal fats is cholesterol, which can be considered a "cousin" to the fat family. Since cholesterol is generally discussed in terms of fats in the diet, this is an appropriate place for its inclusion.

Cholesterol is not a harmful substance as such. The body uses it in all of its tissues. It occurs in the brain, spinal column and skin. Cholesterol is part of the raw materials from which bile salts, sex and adrenal hormones and vitamin D are made. It combines with proteins to enable fats to be carried to the cells.

The liver produces all the cholesterol the body needs for its functions. In an average adult, about 3,000 milligrams of cholesterol are produced each day, regardless if cholesterol is present in the foods eaten or not.

When additional cholesterol enters the body through diet, an excess occurs. Typically, a person consuming animal products ingests about 800 milligrams of cholesterol a day. This extra cholesterol is deposited along the walls of the arteries throughout the body.

As these deposits grow, a condition known as atherosclerosis or "hardening of the arteries" occurs. The arteries become constricted and circulation is seriously impaired. This impaired circulation contributes to a wide variety of problems, including loss of hearing, baldness, shortness of breath, dizziness and heart attacks. All tissues the body are harmed since a reduced amount of oxygen and nutrients reach the cells.

Atheroschlerosis now affects a majority of Americans, regardless of age. Autopsies of infants less than one year old, many of them fed commercially prepared baby formulas, revealed large amounts of cholesterol already deposited within their arteries.

There is absolutely no need for saturated fats or cholesterol in the diet. The body manufactures all of its cholesterol needs. The consumption of additional amounts in the form of saturated animal fats destroys the health of the body at the cellular level.

3. Fat Digestion

Fat digestion takes much longer than the digestion of carbohydrates and somewhat longer than the digestion of proteins. A raw salad consisting of nonstarchy vegetables can be digested within two to three hours. When free fats such as corn, sesame, peanut or other oils are added to the salad, digestion is delayed for another two or three hours.

Coating our food with free oils inhibits the natural digestive processes by preventing digestive juices access to these foods until the oils are digested. Consequently, by the time the oils or fats surrounding the other food particles are digested, the elementary carbohydrates or proteins in the vegetables have begun to ferment (carbohydrates) or putrefy (proteins) in the stomach.

3.1 Fats Require Special Digestion

Free fats, unlike carbohydrates, require special digestive action before absorption. This is because the end products of all digestion are carried in a water medium (that is, the blood and lymph). Free fats are not soluble or transportable in these water mediums until they undergo special changes.

3.2 Tracing Fat Digestion

After fats leave the stomach, they enter the duodenum of the small intestine. Their presence causes the stimulation of the gallbladder, which forces bile down into the small intestine. The bile emulsifies, all the fats in the intestines.

The emulsified fats are then split by enzymes into fatty acids and glycerol. At this point, the fats can be absorbed through the intestinal mucosa. During absorption, the fatty acids and glycerol recombine with a small amount of protein to form microscopic particles of fat called chylomicrons.

The fats in the form of chylomicrons are now soluble enough to enter lymph circulation. The fatty acids are converted to the liver to acetate or ketone bodies as an energy source for the cells.

The fat which is not used immediately for the body's energy needs is stored primarily in adipose tissue. Adipose tissue is a special kind of tissue (found mainly around the stomach, thighs and buttocks) which contains the necessary enzymes to continually produce and release new fat to meet the body's needs.

4. How The Body Uses Fat

Fat is used in the body in four main ways:

1. As a source of heat and energy;
2. As padding and insulation for the organs and nerves;
3. As a regulator for the fat soluble vitamins (A, D, E and K); and
4. As a source of the essential fatty acids.

4.1 Fats Supply Heat and Energy

Each gram of fat supplies nine calories. This is more than twice the amount of energy supplied by a

gram of carbohydrates. The body uses fat in much the same way as it uses carbohydrates. That is, fat is used mainly as an energy food.

Fats are converted to energy by being split into fatty acids and glycerol. Glycerol is then converted to either glucose or glycogen. At this point, the usual processes of carbohydrate metabolism take over to produce needed energy from the glucose and glycogen.

While fats may supply twice the caloric energy of carbohydrates, we find that they must undergo a longer digestive process before they are ready for an essentially carbohydrate metabolism. In general, carbohydrates do a more efficient job of providing the body with readily usable fuel. Fats are valuable in that they may provide a form of stored energy, but strictly speaking, they are not a necessity in the diet as far as a fuel source goes.

Fats, however, are usually more extensively stored within the body than are carbohydrates and may be converted into fuel when the body's carbohydrate reserves are depleted. In fact, this is exactly what occurs when a person goes on a diet, fasts, or is exposed to extremely cold weather. As the stored carbohydrate reserves in the liver are exhausted, the body's fat reserves are metabolized for a new supply.

It should be understood that these fat reserves in the body do not simply come from the fat that is eaten in the diet. When an excess of carbohydrates is eaten, it is converted by the body into fat and stored.

In this way, the body can store and use fat without having a large amount of fat in the diet. The fat deposits could be viewed as a carbohydrate bank, where deposits and withdrawals are made as necessary.

We can see that fat within the body is an important energy and heat source, but strictly speaking, fat in the diet is not an essential outside source for this fuel.

4.2 Fats Provide Padding and Insulation

Within the body, fat deposits provide padding and support for the organs and insulate the body from cold.

For instance, a certain amount of fat is necessary in the buttocks. A loss of most of the fat in this body area actually makes sitting down uncomfortable. Fat tissue is also a special type of connective tissue that aids in the support of certain organs, such as the liver.

Most animals in nature experience an increase in their fatty tissues with the advent of the cold weather. This fat may be used as a fuel source during the winter months when food is naturally scarce and help in the insulating of the body.

This function of fat in the body should not be confused with the role of fat in the diet. Fat reserves in the body do not necessarily come from fat intake in the diet but may instead be developed from the carbohydrates consumed.

4.3 Fats Aid in Absorption of Fat-Soluble Vitamins

Some of the vitamins are termed "fat-soluble." This means that fatty compounds must be present in the intestines for these vitamins to be absorbed. The fat soluble vitamins are A, D, E and K. The other vitamins (B, C, etc.) are termed "water-soluble."

If these fat-soluble vitamins are obtained from the foods in which they naturally occur and eaten in an unprocessed state, they will be readily absorbed by the body. The wholesome foods which contain these vitamins also contain the necessary fatty compounds for their absorption.

If these vitamins, however, are extracted (as in supplements) or occur in foods which have been fragmented, processed or subjected to heat, then their absorption will be impaired. Heating fatty foods,

for example, renders almost all of the fat-soluble vitamins useless.

4.4 Fats Are Sources of the Essential Fatty Acids: Vitamin F

Even if no fat is eaten, the body can manufacture most of its fatty acids from fruit and vegetable sugars. There are three fatty acids, however, that the body is said to be unable to synthesize. These are called the essential fatty acids.

The three essential fatty acids are linoleic acid, arachidonic acid and linolenic acid. The linoleic acid is generally thought to be the most important and has been termed absolutely essential to life by some nutritional researchers. The arachidonic acid can act as a fairly good substitute for linoleic acid. The third acid, linolenic, is said to be only a partially satisfactory substitute for linoleic acid in that it can support growth but cannot aid in the other functions that linoleic acid performs.

4.5 Functions

Collectively, these essential fatty acids are sometimes referred to as vitamin F. The fatty acids or vitamin F are considered necessary for normal glandular activity, especially the adrenal glands. The adrenal and sex hormones seem to require the presence of these fatty acids for their manufacture.

The essential fatty acids are thought to be involved in many of the body's metabolic processes. They promote the availability of calcium and phosphorous to the cells and help form the fat-containing portion of every cell's structure. They are also considered a factor in growth and in reproduction.

4.6 Effect of Deficiency

A lack of vitamin F (the fatty acids) is said to contribute to skin disorders, gallstones, loss of hair, impaired growth and reproductive functions, kidney and prostate disorders and menstrual disturbances.

Since the fatty acids are also said to aid in the growth of intestinal bacteria which help produce the B vitamins, the symptoms of a B-vitamin deficiency may be related to a lack of fatty acids in the diet.

4.7 Requirement

No minimum requirement for vitamin F or the essential fatty acids has been established. The National Research Council has stated that about 1% of the total daily calories of about 2200-2800 per day should consist of unsaturated fats to provide a margin of safety for the intake of essential fatty acids.

The following wholesome foods contain the shown percentages of linoleic acid, the major fatty acid. In general, if the intake of linoleic acid in the diet is adequate, then all other fatty acid needs are also well satisfied.

Food	**% Linoleic Acid**
English walnuts	40
Sunflower seeds	30
Black walnuts	28
Sesame seeds	22

Pumpkin/squash seeds	20
Brazil nuts	17
Pecans	14
Almonds	11
Filberts	10
Pistachios	10
Cashew nuts	3
Avocados	2
Coconuts	1
Raw sweet corn	Trace

It is interesting to determine how much of the above foods would supply the 1% caloric intake of unsaturated fatty acids (in this case, linoleic acid). This is not to suggest that we accept this "1%" figure as an absolute or even as a necessity at all.

However, for the sake of argument, let's assume a daily intake of 2500 calories. At this level, official figures tell us we should have 25 calories of unsaturated fatty acids. By examining the total amount of linoleic acid available in the nuts and seeds in our previous chart and knowing their calorie contents per ounce, we discover that anywhere from one-half to an ounce and a half of these nuts and seeds would give us 25 food calories of linoleic acid.

That is not the sum total of all the unsaturated fatty acids in these foods, nor is it the total of all the other fats we get in our daily diet. It is merely a statement that even if one-half to an ounce and a half of these nuts and seeds were consumed each day, and nothing else, we would still surpass all official recommendations for essential fatty acid intake.

This does not mean that we must eat this small amount of nuts or seeds each day. We should always eat only what the body needs or requires and not become involved with calorie counting or food weighing.

All fresh fruits, for example, contain between 0.5% and 1% unsaturated fat. Some fruits are higher in fat (particularly the avocado which may be 15% to 22% fat). If fruits alone were consumed, we would still have no difficulty meeting the government suggestion that we make 1% of our diet unsaturated fats.

5. Harmful Fats

5.1 Free Oils

The term free oils refers to those fats and oils which are separated from the foodstuffs in which they naturally occur. For instance, peanut oil is a free oil and likewise we can say that lard is a free oil (although somewhat solid).

Free oils in the diet are of vegetable, animal or chemical origin. Some of the free oils are definitely poisonous to the body. The others, while less harmful, have no place in the human diet.

5.2 Vegetable

Some examples of free vegetable oils are corn oil, olive oil, safflower oil, almond oil and the generic cooking oils which may be a mixture of vegetable oils and added chemicals. These are the most commonly used oils in the typical vegetarian diet which excludes all animal fats.

The fat content of these extracted oils is 100%. No proteins or carbohydrates are contained in these oils. Actually, very few minerals are present and only vitamins E and F are present in any amount. We see that these extracted oils are very lopsided nutritionally—they supply oil, but little else. They may be likened to white sugar or white flour as refined products.

In addition, these extracted oils are very susceptible to pesticide residues. Many of the free vegetable oils have chemicals added to them to prevent them from becoming cloudy or going rancid. Unfortunately, however, almost all free oil undergoes a certain amount of oxidation and becomes rancid regardless of the preservative methods used.

The great majority of all vegetable oils are heat-extracted. That is, they are raised to high temperatures in their manufacturing process in order to expel the oils from their vegetable sources. This heat causes a breakdown in the oil's original composition which renders it nutritionally unfit.

Even most of the so-called "cold-pressed" oils sold in health food stores have had a certain amount of heat applied. Although the amount of heat used in these "expeller-pressed" oils (which is really what they are instead of "cold-pressed"), is somewhat lower than conventional methods, it is still high enough to destroy the oil's original composition. Usually, only olive oil and avocado oil have any chance of being extracted without heating methods of some kind.

All free vegetable oils, with the exception of olive oil, have been added to the human diet only in the past hundred years. The human constitution is simply not adapted to handle these large quantities of free oils. .

Even olive oil, the traditional favorite of many health enthusiasts, cannot be recommended. Unless obtained from strictly organic sources, most, olive oil is mixed with other oils and petroleum products. These additives are considered normal by the government and no labeling of their presence is required.

No free oil, not even vegetable oils, should be included in a healthy diet.

5.3 Animal

The most common free animal oils are lard and butter. Strictly speaking, these are not pure oils or fats. Butter is about 87% fat, while lard is 94% fat. Because of their high fat content and their use outside of their naturally occuring sources (milk and meat), they will be discussed as examples of free animal oils.

The reasons for abstaining from animal free oils (or any animal fats) are basically the same as those for avoiding all animal products in the diet.

Like human beings, animals tend to store the accumulated pesticides, chemicals and additives from their diet in their fatty tissues. Consequently, lard and all animal fats are a concentrated reservoir of environmental poisons.

The animal fats are usually superheated during their extraction and tend toward rapid rancidity almost immediately.

Butter is usually colored and salted and is suspect to the hormonal and additive contamination from the cow.

Like all animal fats, the animal free oils are high in cholesterol which may eventually result in destruction of the cardiovascular system.

No free oil, and certainly not free animal fats, should be included in a healthy diet.

5.4 Chemical

This is a new one. Thanks to the synthetic food industries and the availability of petroleum by-products, free oils made from chemicals are being introduced into the diet. These chemical oils appear in ice cream, artificial coffee creams, artificial butter, etc.

Strangely enough, the people who consume these chemical oils often do so out of a concern for their health. They seek to avoid cholestrol and instead eat chemicals produced by the petroleum industries.

The plastic margarine and imitation coffee cream and ice cream that people eat may have a worse effect than the animal products they purport to replace. At least butter and cream have been a regular part of some people's diet for hundreds of years. Most of these chemical oils have been on the market for less than ten years. No one has any idea as to the eventual harm they may cause.

The eating of these chemical oils is done to satisfy a purely psychological need. They are devoid of nutrition and undermine the body's health.

No free oil, and absolutely never any chemical oils, should be included in a healthy diet.

5.5 Fats In Cooking

Although a lot of fat is consumed in the typical American diet in the form of free oils, the largest amounts of fat are consumed from eating those foods which have been cooked with fat.

French fries, potato chips, doughnuts, cakes, snack foods—almost all the "convenience" foods and junk foods eaten—contain high percentages of heated fats.

When fats and oils are heated to a high degree as in cooking or frying, they become carcinogenic—capable of causing cancer. Healthy cells may become cancerous, that is, "go wild" if the diet is high in heated oils because heated oils are extremely toxic.

The digestive processes for the assimilation of fats require that the fats be emulsified. Fats that have been heated in cooking cannot be emulsified or digested. Since they cannot be used by the body, these overheated fats must be eliminated. Fats which have been subjected to a high degree of heat are difficult for the body to break down and expel. If the body has no use for a substance and cannot effectively eliminate it from the system, then the body stores the substance where it can do the least harm or walls it off by creating a tumor around it.

Besides the heated fats themselves, the foods that are saturated with these cooked fats are also indigestible and poisonous. Starches such as potatos, pastries, breads, etc. that are soaked in hot fat become impossible for the body to convert to sugar—the essential part of starch digestion. These foods then are worse than nutritionally useless since they also place a strain upon the body to eliminate them.

Any food values associated with oils or fats are lost when they are heated. As fats reach 350 degree

temperatures, the standard range for frying and cooking, they begin to decompose totally and lose all their vitamins and minerals. They also prevent the absorption of any other fat-soluble vitamins and so contribute to the nutrient starvation of the body.

6. The Use Of Fats In The Optimum Diet

Now that we have discussed the harmful effects of animal fats, free oils and heated fats, we should examine the wholesome sources of fat in the diet. First, there are no such things as "fat-free foods." All foods that are part of the human dietary contain fat. Every cell of every living plant and animal contains fat.

6.1 Fat Contents of Wholesome Foods

There are, of course, different fat contents in different foods. The following chart shows the fat content of foods natural to the human diet:

Food	**% of Fat (by Calories)**
Fruits (Apple)	3
Vegetables (Spinach)	15
Mother's milk	55
Avocados	77
Seeds (Sesame)	70
Coconut (Mature)	79
Nuts (Hazelnut)	81

data from nutritiondata.com

6.2 Nuts, Seeds and Avocados As High-Fat Sources

Nuts and seeds that are fresh, unroasted and unsalted are acceptable high-fat foods. If digestion permits, these should be eaten fresh in their whole state. If used as a nut butter or dressing, they should be made at home immediately before eating. All manufactured nut and seed butters, even those labeled as "raw," undergo some degree of oxidation and become somewhat rancid.

When eaten, nuts and seeds should be masticated thoroughly. For ease of digestion, only a single variety of a nut or seed should be eaten at one meal. These high-fat foods combine best with leafy green vegetables and other non-starchy vegetables. They should not be eaten with starchy vegetables, fruits or

avocados.

Coconuts, although rich in saturated fats, may be added to the diet in small quantities and also combined with leafy green vegetables. Coconuts should not be combined with fruits, as is sometimes done, to avoid fermentation of the fruits.

Avocados are another wholesome high-fat food. They are best eaten with nonstarchy vegetables. The nutritive value of an avocado and nuts is quite similar; the avocado simply has a higher water content.

6.3 Olives as food

Olives are the only other fruit besides avocadoes that have a high fat content. They are a wholesome food only if eaten in their natural dried state. Unfortunately, sundried natural olives are very difficult to locate. Olives that are canned, bottled or pickled are indigestible and should not be eaten. Olive oil, while perhaps the potentially less harmful of all the free oils, has no place in the optimum diet.

6.4 Recommendations

Although no specific amounts of these foods are recommended, it should be noted that many practitioners of Natural Hygiene suggest that no more that three to four ounces of nuts or seeds be eaten daily or no more than one avocado. The body appears to have difficulty in handling much larger amounts. Of course, this also means that one may certainly eat less than these amounts or no amount whatsoever. These are not recommendations for eating these foods daily, but suggestions that these foods should be consumed in limited amounts.

7. Questions & Answers

Just how necessary is fat? Can we live without it?

> First, we must make an important distinction between fat in the body and fat in the diet. Fat in the body is absolutely necessary for our health. It exists in every cell and performs a vital role in our metabolic functions. We could not live without it. Now fat in the diet is a somewhat different matter. It is also omnipresent. It is in every food we eat. The fat needed in the body can also be formed from the carbohydrates in the diet. Fat in the body does not have to come from high-fat foods.

I like salads, but I couldn't make a meal out of them unless I add salad dressings. Aren't there some acceptable salad oils?

> The only acceptable oil for a salad is the oil as it naturally occurs in the complete wholesome food. When you use extracted vegetable oils, you are coating all your foods with a layer of rancid fat. Free oils are simply too unstable and fragmented to be used safely.
>
> There are, however, some acceptable alternatives. I would first suggest eating a small amount of nuts or seeds or avocado along with your salad. By adding a small amount of these high-fat foods, a salad can give you the "full feeling" which is caused by the slow digestion of the accompanying fats. The second alternative, while not as good, is to blend a few nuts or seeds or avocado with a tomato and/or a small amount of distilled water. This

makes an acceptable salad dressing substitute if used immediately after making.

Nuts and seeds are hard for me to digest. How can I get my fats?

By eating a calorie-sufficient diet of wholesome foods. It is not necessary to eat high-fat foods to obtain fat in your diet, nor should we feel obligated to eat any foods, even wholesome foods, because of some particular nutrient value. Eat only what you can relish and digest. Many Life Scientists go for months without eating high-fat foods, especially during the warmer seasons.

I'm underweight. Shouldn't I eat high-fat foods to gain weight?

Many underweight problems arise from metabolic instead of dietic problems. Fats are difficult to digest. If your powers of digestion and assimilation are somewhat weak, as is often the case with underweight people, fats are not good foods to eat. The best foods for weight gain are not the high-fat foods, but the high-carbohydrate foods. Sweet fruits such as bananas, dates, figs, grapes, raisins, etc. are the best high-carbohydrate foods for weight gain.

Fats play a variety of roles in the health of the body. Most diets today have an excess of fats, which contributes to a number of diseases and problems. The fat intake in a diet should be limited as much as possible.

A deficiency of fats in the diet is a nutritional rarity. Usually this can only occur after a period of nutrient starvation or from a metabolic impairment. Fats are present in every food we eat.

High-fat foods are difficult to digest and should be consumed in small quantities. Only wholesome high-fat foods should be eaten at all. This means that no animal fats, free oils or heated fats should ever be included in the diet.

A diet consisting chiefly of fruits and vegetables eaten in their natural state, possibly supplemented by moderate amounts of seeds and nuts (at separate meals) can supply us with all the fats we need and optimally meet our other nutritive needs as well.

Article #1: A Natural Diet And Sunlight Could Save Your Life By Dr. Zane R. Kime, M.D.

A leading physician with a degree in nutrition offers some guidelines for the optimal diet—a diet which can actually reverse some of the ailments associated with aging.

Several research centers here in the United States have been developing a diet that can reverse hardening of the arteries (atherosclerosis). Some authorities now believe that this same diet may dramatically aid in prevention and treatment of heart disease, appendicitis, diverticular disease, gallstones, hypertension, varicose veins, deep vein thrombosis, pulmonary embolism, hiatus hernia, hemorrhoids, certain types of cancer, colitis and obesity.

This diet is a very natural diet. It is a vegetarian diet. It is low in fat and protein and high in complex

carbohydrates such as potatoes, beans, corn, fresh fruit and most other unprocessed foods. Refined foods should be eliminated.

A natural food is one that comes with all its bulk and all its fiber plus all the vitamins and minerals. The vitamins and minerals are there to help metabolize and digest the natural food. Nature intended that we take in the bulk and the fiber plus the vitamins and the minerals and other nutrients all together to have a harmonious nutritional balance.

Foods that are not natural and not included in the diet include those that have been processed or have passed through a chemical factory. Examples abound. A walk through any supermarket will reveal aisle upon aisle of highly refined, overprocessed foods which, unfortunately, are the mainstay of the American public's diet. The most prevalent, of course, are white sugar and refined (white) flour.

Once part of a natural food, sugar cane or sugar beets, refined sugar is almost universally used in processed foods. The health consequences of sugar consumption are well known. But while less visible, its more subtle effects are equally insidious.

Protein

The Standard American Diet (SAD) also contains too much refined protein. Meat, as a "prime" example, contains lots of protein, but little else. It is a concentrated food, but not a particularly good one in terms of overall balance. Many other products advertised as "high in protein" would also fall into this category of overly refined foods. This includes all protein supplements.

Quite simply, a diet of complex carbohydrates—beans, rains, fruits and vegetables—will provide sufficient protein (and indeed superior nutrition) for an adult. The protein scare is a lot of hype. It is not necessary to supplement a natural foods, vegetarian diet, as it is virtually impossible to get a protein deficiency if one is eating enough calories. It is not necessary to complement amino acids in every meal if one is eating a variety of whole natural foods in a day's time.

Oil is another example of food that is refined no matter what its process of extraction is, since it no longer is a whole food. The oil is an extract of a vegetable or animal product in which all the bulk and fiber are removed, plus many of the vitamins and minerals. All that is left is a pure chemical that is classified as a triglyceride. Numerous diseases now are being recognized as associated with too much oil in the diet, and this includes sesame, safflower, soy, olive and other commonly used oils. It takes many ears of corn to produce one tablespoon of corn oil. Essential fatty acids are needed in the diet but can be adequately supplied by whole grains, nuts, seeds and legumes where they are in a water-soluble form. The oil in a nut, for example, is water-soluble; the extracted oil from a nut, no matter how it is processed, is no longer water-soluble. The body seems better able to utilize properly the oil in its water-soluble form, but seems to have serious complications with the non water-soluble, extracted, refined form. The association of a diet high in oil—whether saturated or polyunsaturated—and disease is actually well documented, though this is not well known to the public.

Heart Disease

The average American has a cholestrol level somewhere between 150 and 300 mgm. percent. The average American also has a very high rate of heart attack, stroke and other chronic degenerative diseases. The World Health Organization, in studying many developing countries, has found that their cholestrol levels are much lower than this American average. Many developing countries have cholesterol in the area of 90 to 120 mgm. percent. It is the feeling of some authorities that cholesterol levels of about 140 can begin to produce hardening of the arteries.

To reverse or prevent hardening of the arteries, a low-fat diet is necessary. A diet low in fat means that it is low in all fats—saturated, unsaturated and polyunsaturated. This would eliminate from the diet many of the products that are highly advertised and can be bought in most any supermarket, such as margarine,

mayonnaise, oils, most of the salad dressings, butter fat as found in most of the dairy products, and egg yolks.

Meat is very high in fat, at least 44%. Commercially processed nut butters should be minimized in the diet, as they have been so finely ground that the oil has separated from the original nut and therefore is no longer in its original water-soluble form. It would be acceptable to eat nut butters if one were able to grind them less finely in order that there be no separation of the oil from the nut being used, whether almond, sesame, cashew or peanut (a legume).

Many of the harmful effects of saturated fats also appear when polyunsaturated fats are used. In addition, the polyunsaturated fats have many of their own harmful effects. Some people still believe that polyunsaturated oil is good because it lowers the cholesterol level in the blood. Indeed, many doctors even prescribe tablespoons of corn oil or other types of oil every day to help lower blood cholesterol. Polyunsaturated fats will indeed lower the serum cholesterol. According to research done by Dr. Scoll Grundy, it moves the cholesterol from the bloodstream into the tissues, where it's more harmful.

Dr. R.A. Swank from the University of Oregon has published a number of studies showing the effects of fat in causing the red blood cells to stick together. After feeding some hamsters a meal of cream, he noticed that the little red blood cells started sticking together. They would not pass through the capillaries, but would block them off. Since the red blood cells carry oxygen to the tissues, he also found there to be a great decrease in oxygen in the tissues. Following a high-fat meal, the oxygen content of the tissues of the brain was measured and found to be markedly decreased.

Dr. Meyer Freedman found that both saturated and unsaturated fats caused this sledging or sticking together of red blood cells. His article in the *JAMA* stated that substitution of the unsaturated for the relatively saturated fats did not lessen the interference in capillary blood flow. If such interference in the flow also occurs in the critically important collateral vessels of the coronary circulation in cardiac patients, then the ingestion of unsaturated fats could lead to disaster as readily as ingestion of saturated fats.

In another article in *JAMA*, Dr. Peter Kuo described a study he had conducted on patients who had angina pectoris. This is a pain in the chest that is caused by a lack of blood supply to the heart. He took fourteen patients and fed them a high-fat meal. All of his patients had angina, but it was an intermittent thing and was easily controlled by their heart medications. However, after the high-fat meal, these patients all experienced a tremendous increase in chest pain, and they actually had changes in the electrocardiograms and their ballistocardiograms.

Some have recommended unsaturated oil as a treatment for heart disease. Dr. G.A. Rose of England studied a large group of people in which he added corn oil to their diets to see if this would protect them from developing heart disease. His study concluded that corn oil cannot be recommended as a treatment of ischemic heart disease and that it is possibly harmful.

Supporting this theory was an article in the *American Heart Journal* stating that polyunsaturates have increased in the average American diet almost threefold over the past three decades without the slightest decrease in heart disease mortality.

The National Heart and Lung Institute admits that any difference in the effects of saturated versus polyunsaturated fats in heart disease is strictly intuitive, and based only on personal impressions and fragmentary conclusions with unscientific proof.

The Food and Drug Administration has gone on record saying, "It is a violation of the law to make any claim that polyunsaturates could prevent or treat heart disease." Several researchers have shown that polyunsaturated fat will inhibit the white blood cells.

Other researchers have observed native people who drank lots of milk which contained its own butterfat in the form of cream (although it rises to the top, it still is water-soluble); they nevertheless had low cholesterol counts. Another group of people were subsequently studied substituting a cube of butter each

day for its equivalent in milk ' (one cube of butter for two quarts of milk). The result was a rise in cholesterol. The solid form of the butter was no longer water-soluble.

In November 1977 Dr. Howard of the University of Cambridge published his studies on cholesterol and dairy products in *Lancet*. He concluded that of all the dairy products only butter raised the cholesterol levels when ingested.

The theory then might be formulated, based on Dr. Howard's study, that cholesterol in its water-soluble form does not raise cholesterol levels. In order to check this, a series of experiments was performed at a small college. Following are the tests and results:

Eighteen young men on a natural vegetarian diet of vegetables, fruits, legumes, nuts, seeds, avocadoes and whole grain were checked for their cholesterol level which was 120 to 300.

They were then divided into three groups.

- Group I continued their natural vegetarian diet.
- Group II continued their natural vegetarian diet and added two eggs (hard or poached).
- Group III continued their natural vegetarian diet and added two eggs (hard or poached) and margarine.

Five weeks later, the results were:

- Group I cholesterol same.
- Group II lower, but no difference statistically.
- Group III cholesterol rose to 170, with some over 200.

As mentioned before, some authorities feel that cholesterol above 140 can begin to produce hardening of the arteries. The above study may therefore be significant in explaining why lacto-ovo vegetarians may develop hardening of the arteries.

Although lacto-ovo vegetarians have lessened their risks of heart diseases and hardening of the arteries due to omitting meat in their diet, they nevertheless would improve their risks by eliminating or at least minimizing some of the dairy products such as butter, as the fat is no longer in its soluble form.

On the other hand, neither is milk desirable, especially regular commercial milk, because it has been pasteurized and homogenized at high heat and enriched with vitamin D (which is really a hormone, like a steroid). Protein-fortified milk is especially undesirable, as it has been fortified with dry milk, and even nonfat milk contains cholesterol.

Cholesterol oxidizes when dried, and it may actually produce cholesterol. Dried milk or any dried animal product should be omitted from the diet.

Gallstones

Prairie dogs have been used to study the effects of different types of fats and cholesterol in producing gallstones. On a high-fat diet, the prairie dogs seemed to develop gallstones easily. When they were placed on a diet that was low in fat and cholesterol, the gallstones dissolved.

Gallstones in humans do not seem to be limited to high saturated fat content in the diet. Dr. R. A. L. Sturdement reported a significant increase in gallstones in men fed a diet that was rich in safflower oil. Dr. T. Osuga wrote that corn oil alone, without cholesterol in the diet, produced gallstones.

Cancer

According to Dr. R. K. Bout well, the stimulating effect of fat on the rate of formation of certain types of tumors is well established. Dr. Pickney, previously mentioned in regard to polyunsaturates in the diet and its relation to heart disease, also wrote about the epidemiologic association between a diet high in

polyunsaturates and the increased incidence of cancer, especially gastric, in humans. He discussed his research in the *American Health Journal* showing that 78% of the people who used more polyunsaturated fat also showed marked clinical signs of premature aging. In addition, they looked much older than their chronological age. In the same group, 60% reported that they had had at least one or more skin lesions removed because of suspected malignancy after having altered their dietary fat.

Dr. Ernest Winder of the American Health Foundation states that both epidemiologic and animal data suggests that colon cancer is due largely to high fat consumption. (Refined foods lacking in bulk and fiber also have been linked to bowel cancer, and studies made in Japan have correlated high fat diets with cancer of the breast in women—Veg. Times Ed.)

Dr. Bauman, in the *American Journal of Cancer*, showed that an increase in the fat content of the d :t accelerated the appearance of tumors caused by ultraviolet radiation. Dr. Bausch repeated the study using corn oil and got the same results. Ultraviolet light is found in sunlight. The current understanding is that excessive exposure to ultraviolet light is responsible for skin cancer, when in fact, as these studies show, the true culprit may be a high-fat diet in combination with ultraviolet light.

Fats turn rancid in the tissue. Fats that are oxidizing damage the tissues, thus stimulating cancer (and aging of the skin). Oxidation is prevented in nature with vitamin E in its natural state: in nuts, whole wheat, seeds, legumes, etc. Vitamin C, carotene and selenium also help.

Unsaturated fats eventually turn rancid due to air, heat and sun. All the elements are present when refined polyunsaturated oils are in the tissues: the heat and oxygen are provided by the body and the sun's ultraviolet rays accelerate the oxidation of the fat in the body. Without the oxidation of rancid fat in the tissues, the sun is beneficial for a healthy body.

Exposure of the body to the sun is vital for optimum health. It is a natural source of vitamin D (which is different form that artificially ingested as an additive in milk). Most times of the year as little as about fifteen minutes exposure on the face will give more than the recommended daily amount. Contrary to popular belief, vitamin D can be stored in the body. Even on cloudy or foggy days, 80% of the ultraviolet rays come through; however, the rays are locked entirely by glass windows. Nevertheless, special glass can be ordered called UV-Passing Plexiglass that is very good.

Obesity

In a natural diet where no sugar or fat of any kind is added, obese people will lose weight even though they are eating all they want. They are allowed to have potatoes, ice, bread, fresh fruit and any other natural food in any quantity that they want. However, they should restrict the amount of avocadoes, olives and nuts that they eat on this diet. There are built-in safety factors in the natural food provided for us that prevent us from becoming obese.

Our bodies are designed to eat a low-fat diet. When we add extra fat to the natural diet, we start to gum up the beautiful machinery we were given. There is an abundance of natural fat in the unrefined grains, legumes and other vegetables that more than meets our need for fat in the diet. It is impossible to get a fatty acid deficiency if whole grains, legumes and other vegetables are included in the diet; it is not necessary to add any extracted oil to provide the fat that is needed in the diet. Because our bodies were designed to eat a low-fat diet, a high-fat diet will cause nothing but trouble, whether the fat is of animal or vegetable origin. Probably the biggest proof we have that a low-fat diet is essential is the miracle that happens in patients lives when they are placed on a diet free from margarine, mayonnaise, grease and oil of all kinds.

Diseases that are caused by artherosclerosis are markedly proved. The world of medical research is only now discovering the tremendous power in a natural vegetarian diet.

Editorial Note: Grains and legumes are not needed in the diet to assure enough fat and essential fatty acids. Fruits, nuts, seeds and avocadoes all contain plenty.

Article #2: Fats In The Diet By Marti Fry

The subject of fats in the diet is one that receives little attention, especially compared to the attention it should receive! Along with refined sugar and flour chemicals, all of which are very antivital and disease-causing, fats should be listed. This is not to say that all fats are very toxic. But it is to say that the only ones that aren't are those contained in raw (uncooked, unheated) natural foods to which humans are biologically adapted to eating—avocadoes, nuts and seeds plus all fruits and vegetables recommended in the Life Science diet.

When considering toxic substances that are eaten, the reason most fats should be included as toxic is because all fats become highly carcinogenic when heated. Even rancid fats, as in stale nuts or seeds, are harmful and should not be eaten. Nuts or seeds should never be eaten roasted, either.

Atherosclerosis, heart disease, cancer, senility and arthritis are just a few of the most serious diseases with which many Americans (and people the world over) are plagued. These diseases would not have become a problem to anyone if our people had not eaten heated fats and oils. Frying is the worst way to cook foods, though all cooked foods are pathogenic. Remember: All foods contain some fat. Therefore, any food that is cooked, even if it's not fried, contains a carcinogen—heated fat. This is one of the most serious of the many problems with cooked foods.

High-Fat Foods In The Diet

A question not raised by most Life Scientists is whether we really need high-fat foods such as nuts, seeds or avocadoes in our diet at all. Our need for fats is so low, and the presence of fats in all foods so ubiquitous, that it is likely that we would fare better if we would not include nuts, seeds or avocadoes in our diet.

Yet, Hygienists recommend up to four ounces of nuts or seeds or one avocado per day in the diet.

Why?

For one thing, they are delicious raw. Secondly, and most important, they are very satisfying, keeping the sensation of hunger away for a longer time than other fruits or vegetables.

Many people, including some Hygienists, have difficulty digesting nuts and seeds. Most have little or no trouble with avocadoes. This could be, as one professional Hygienist has stated, because most of us have weakened digestive capabilities as a result of so many years of wrong eating and living practices. In any event, no conclusive statements can be made at this time. More research would perhaps be in order.

It is certain that humans can fare well without high-fat foods in their diet. But is it practical? Can people feel satisfied without including either oils (fats) or starches in their diet? Can a diet of nonfat and nonstarchy foods satisfy? If it can meet our needs—which there is no doubt it can and does—then it follows that it should satisfy. Perhaps it would take months or years for a person to become accustomed to this type of ideal diet.

This is an area that will warrant further study by professionals in the field. One thing you can be sure of, however, is that the amount of fat needed in the diet is extremely small and should be met only from raw foods. No foods should be eaten that will leave an oily film on a plate or bowl that will not wash off with water and a cloth or sponge—without any kind of soap or detergent. That is to say that only water-soluble oils should be consumed. These are the only oils that will not cause diseases in the human body.

For a long and healthy life, keep your fat consumption to a minimum; consume only water-soluble fats; and stay away from free oils and nut butters except those you make fresh yourself without adding free oils. You'll be many times further ahead healthwise than the lacto or lacto-ovo vegetarians who still

consume many foods that are in many ways as harmful or almost as harmful as animal flesh. You will become healthier than you've ever been in your entire life!

Article #3: Are We Oil And Fat Eaters By T.C. Fry

It is well known that most meat eaters trim the fat off meats because they have an aversion to it. This is not without a sound physiological basis.

However we witness millions eating foods fried in oils and fats. Millions eat foods smothered in oils, butter, margarine and other fats. Oils and fats constitute about 40% of the American caloric intake.

For this heavy indulgence Americans pay dearly. Indigestion is an American institution. Pathogenic effects are rife. It is said that 50% of all American meals result in indigestion. Antacids are a multi-billion dollar business. At the door of oils and fats can be placed much of the blame.

Humans are constitutionally frugivores. All the fats needed in the human system are self-created from the raw materials furnished by carbohydrate foods just as cattle elaborate their fats from a grass diet. It is not necessary that humans eat oils or fats of any kind to have the body oils and fats necessary for great well-being. One of the chief complaints of many who eat sugar and wheat products is that it turns into unwanted fat, thus indicating how efficiently our organisms convert carbohydrates to the oils and fats we need.

Fruits we digest with dispatch, efficiency and comfort. Most are discharged from the stomach in from 10 to 30 minutes, whereas oils and fats lay heavy on the stomach for hours before digestion really begins.

To be sure, our diet can profit from certain foods with an oil content. From nuts and seeds we can obtain the linoleic and linolenic acids that we need. But if nuts, seeds and avocadoes constitute a mere 1 1/2% to 2% of our diet, that is ample.

Professional Hygienists point out that the body's needs for oil are very small. All condemn free oils, that is, oils out of context with the food in which nature developed them.

Most Americans eat oils and fats with foods that are of a differing digestive character than oils. In the combination of bread and butter or bread and margarine or bread and peanut butter—quite common combinations, the bread requires an alkaline medium for its digestion. Within two or three hours starches are usually ready to pass into the intestinal tract for appropriation. Fats and oils usually do not begin to digest until about the fourth hour.

Hence, when oils and fats are eaten with other foods such as starches they coat the food particles such that little or no digestion results, but indigestion does! By the time the oils or fats surrounding the other food particles are digested, the starches and sugars are food for bacteria instead of us. Bacteria convert carbohydrates into poisonous acids (especially acetic) and alcohol. Our stomachs become a fermenting mess. Caustic bicarbonates end the process by killing off the bacteria and neutralizing the acids.

But this is merely a first step in a chain of problems. Indigestion is bad enough, and employing antacids begets yet other problems. Fats degenerate into butyric and other acids. This begins a long train of pathology that can exhibit as inflammations, ulcers and eventually cancer. Rashes, pimples, biliousness, a "tired feeling" and other complaints are often a direct result of a heavy oil or fat meal.

Fats are often in association with cholesterol, another form of alcohol. We create this in our bodies for our own needs, but we cannot handle foreign cholesterols as true meat-eating animals do. To be sure, cholesterols are found only in animal fats such as cheeses, butter, eggs, meat and animal products such

as milk, ice cream, etc. When the cells reject alien cholesterol, it combines with blood contents, especially wastes and inorganic minerals, and forms plaque in the circulatory system.

Free oils and fats are a disaster in the human digestive tract no matter how eaten. Oils on salads, popcorn, bread and other foods (most of them unwholesome in themselves) interfere with digestion as heretofore stated.

When we eat fried foods, we are invariably inviting disaster. Even before eating such foods, the heat of cooking has converted some of the fats or oils to acroleic acid (or it has become acrolein) which is deadly poisonous and carcinogenic in humans. Fats in animal foods are always bad for us. Oils in vegetable and fruit foods should be eaten rarely, say not more than once every two or three days. We handle nuts, seeds and avocadoes fairly well, but our need for them is small. Further, great caution must be employed in eating such foods. Always eat them with vegetables, never with foods that contain a carbohydrate complement. Tomatoes, cucumbers, celery, cabbage family members and green leafy foods such as lettuce combine best with these oil-bearing foods.

It is noteworthy that legumes are heavy in oil but, once beans and pulses are sprouted, their fat content is converted into easily digestible vegetable matter.

There is no truth to the widely circulated belief that oils are good for dry skin. In digesting oils and fats, the body converts them to sugars anyway. Then it reconstitutes them to its specific needs in the body's own chemical factories. Thus dry skin is the result of impaired function of the sebaceous glands, not a lack of oil in the diet.

Oily foods should not be used as fuel foods. Carbohydrate foods serve us amply in this regard. Loading up on oily foods will not enhance the performance of athletes or manual workers. Their need for the oils and proteins of concentrated foods such as nuts, seeds and legumes are no greater than for sedentary people. It is well to repeat again that carbohydrate foods supply this best, and fruits are our most wholesome and efficient sources of carbohydrates.

Only one meal in any given day should contain a heavy oil-bearing food. And only one concentrated oil-bearing food should be eaten at a meal. Thus, if you eat an avocado with a salad, your oil license for the day has run out. If you eat two to four ounces of nuts or seeds with a salad, your oil license has expired, not only for the meal, but for the day.

Studies have shown that peanut oil is more "atherogenic" than even cream from cow's milk in inducing arteriosclerosis in monkeys. It has been suggested that free oils actually promote the deposition of cholesterol and other lipids in the arterial walls.

Proceed with caution with oils. Never eat them outside of their natural context and then eat them in restriction as above noted.